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FILE 'HOME' ENTERED AT 18:03:15 ON 07 OCT 2005

=> file medline, uspatful, dgene, embase, wpids, fsta, jicst, biosis, biotechds,
scisearch

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ENTRY	SESSION
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FULL ESTIMATED COST

FILE 'MEDLINE' ENTERED AT 18:03:44 ON 07 OCT 2005

FILE 'USPATFULL' ENTERED AT 18:03:44 ON 07 OCT 2005

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=> s "1,3-propanediol production"
5 FILES SEARCHED...

L1 125 "1,3-PROPANEDIOL PRODUCTION"

=> s l1 and (glycerol or dihydroxyacetone)
L2 106 L1 AND (GLYCEROL OR DIHYDROXYACETONE)

=> s l2 and (citrobacter or klebsiella)
L3 67 L2 AND (CITROBACTER OR KLEBSIELLA)

=> e laffend, l/au
E1 3 LAFFEND LISA A/AU
E2 5 LAFFEND LISA ANNE/AU
E3 0 --> LAFFEND, L/AU
E4 1 LAFFER B G/AU
E5 21 LAFFER C/AU
E6 58 LAFFER C L/AU
E7 1 LAFFER CHERYL/AU
E8 19 LAFFER CHERYL L/AU
E9 8 LAFFER J/AU
E10 3 LAFFER J L/AU
E11 1 LAFFER J P/AU
E12 4 LAFFER L L A/AU

=> s e1
L4 3 "LAFFEND LISA A"/AU

=> s e2
L5 5 "LAFFEND LISA ANNE"/AU

=> s l4 and l5
L6 0 L4 AND L5

=> d l4 ti abs ibib tot

L4 ANSWER 1 OF 3 USPATFULL on STN
TI Process for the biological production of 1,3-propanediol with high titer
AB The present invention provides an improved method for the biological
production of 1,3-propanediol from a fermentable carbon source in a

single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the Klebsiella pneumoniae dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type Klebsiella pneumoniae. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in E. coli of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:225862 USPATFULL
 TITLE: Process for the biological production of
 1,3-propanediol with high titer
 INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES
 Haynie, Sharon L., Philadelphia, PA, UNITED STATES
Laffend, Lisa A., Claymont, DE, UNITED STATES
 Pucci, Jeff P., Pacifica, CA, UNITED STATES
 Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	29	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3915	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 2 OF 3 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer
 AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the Klebsiella pneumoniae dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type Klebsiella pneumoniae. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a

1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in E. coli of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:33323 USPATFULL
TITLE: Process for the biological production of
1,3-propanediol with high titer
INVENTOR(S): Emptage, Mark, Wilmington, DE, United States
Haynie, Sharon L., Philadelphia, PA, United States
Laffend, Lisa A., Claymont, DE, United States
Pucci, Jeff P., Pacifica, CA, United States
Whited, Gregory, Belmont, CA, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,
United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6514733	B1	20030204
APPLICATION INFO.:	US 2000-641652		20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Walicka, Malgorzata A	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)	
LINE COUNT:	3730	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 3 OF 3 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
TI Process for the biological production of 1,3-propanediol with high titer.
AB The present invention provides an improved method for the biological
production of 1,3-propanediol from a fermentable carbon source in a single
microorganism. In one aspect of the present invention, an improved
process for the conversion of glucose to 1,3-propanediol is achieved by
the use of an E. coli transformed with the Klebsiella pneumoniae dha
regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ,
all these genes arranged in the same genetic organization as found in wild
type Klebsiella pneumoniae. In another aspect of the present invention,
an improved process for the production of 1,3-propanediol from glucose
using a recombinant E. coli containing genes encoding a G3PDH, a G3P
phosphatase, a dehydratase, and a dehydratase reactivation factor compared
to an identical process using a recombinant E. coli containing genes
encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase
reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The
dramatically improved process relies on the presence in E. coli of a gene
encoding a non-specific catalytic activity sufficient to convert
3-hydroxypropionaldehyde to 1,3-propanediol.

ACCESSION NUMBER: 2003:129736 BIOSIS
DOCUMENT NUMBER: PREV200300129736
TITLE: Process for the biological production of 1,3-propanediol
with high titer.
AUTHOR(S): Emptage, Mark [Inventor, Reprint Author]; Haynie, Sharon L.
[Inventor]; **Laffend, Lisa A.** [Inventor]; Pucci,
Jeff P. [Inventor]; Whited, Gregory [Inventor]
CORPORATE SOURCE: Wilmington, DE, USA
ASSIGNEE: E. I. du Pont de Nemours and Company

PATENT INFORMATION: US 6514733 20030204
SOURCE: Official Gazette of the United States Patent and Trademark
Office Patents, (Feb 4 2003) Vol. 1267, No. 1.
<http://www.uspto.gov/web/menu/patdata.html>. e-file.
ISSN: 0098-1133 (ISSN print).
DOCUMENT TYPE: Patent
LANGUAGE: English
ENTRY DATE: Entered STN: 5 Mar 2003
Last Updated on STN: 5 Mar 2003

=> d 15 ti abs ibib tot

L5 ANSWER 1 OF 5 USPATFULL on STN
TI 1,3-propanediol and polymer derivatives from a fermentable carbon source
AB A new polypropylene terephthalate composition is provided. The
polypropylene terephthalate is comprised of 1,3-propanediol and
terephthalate. The 1,3-propanediol is produced by the bioconversion of a
fermentable carbon source, preferable glucose. The resulting
polypropylene terephthalate is distinguished from petrochemically
produced polymer on the basis of dual carbon-isotopic fingerprinting
which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:120275 USPATFULL
TITLE: 1,3-propanediol and polymer derivatives from a
fermentable carbon source
INVENTOR(S): Burch, Robert R., Exton, PA, UNITED STATES
Dorsch, Robert R., Hockessin, DE, UNITED STATES
Laffend, Lisa Anne, Claymont, DE, UNITED
STATES
Nagarajan, Vasanth, Wilmington, DE, UNITED STATES
Nakamura, Charles, Claymont, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003082756	A1	20030501
APPLICATION INFO.:	US 2002-213203	A1	20020805 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1999-369796, filed on 6 Aug 1999, GRANTED, Pat. No. US 6428767 Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, GRANTED, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, GRANTED, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Page(s)		
LINE COUNT:	1785		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 2 OF 5 USPATFULL on STN
TI Method for identifying the source of carbon in 1,3-propanediol
AB A new polypropylene terephthalate composition is provided. The
polypropylene terephthalate is comprised of 1,3-propanediol and
terephthalate. The 1,3-propanediol is produced by the bioconversion of a
fermentable carbon source, preferable glucose. The resulting
polypropylene terephthalate is distinguished from petrochemically
produced polymer on the basis of dual carbon-isotopic fingerprinting

which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:194542 USPATFULL
TITLE: Method for identifying the source of carbon in
1,3-propanediol
INVENTOR(S): Burch, Robert R., Exton, PA, United States
Dorsch, Robert R., Hockessin, DE, United States
Laffend, Lisa Anne, Claymont, DE, United
States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles, Claymont, DE, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,
United States (U.S. corporation)
Genencor International, Inc., Palo Alto, CA, United
States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6428767	B1	20020806
APPLICATION INFO.:	US 1999-369796		19990806 (9)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, now patented, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Wang, Andrew		
ASSISTANT EXAMINER:	Zara, Jane		
NUMBER OF CLAIMS:	1		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)		
LINE COUNT:	1761		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 3 OF 5 USPATFULL on STN

TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a
single microorganism
AB A process is provided for the bioconversion of a carbon substrate to
1,3-propanediol by a single organism utilizing either microorganisms
containing the genes encoding for an active glycerol or diol dehydratase
enzyme by contacting these organisms with a carbon substrate under the
appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:18270 USPATFULL
TITLE: Bioconversion of a fermentable carbon source to
1,3-propanediol by a single microorganism
INVENTOR(S): **Laffend, Lisa Anne**, Wilmington, DE, United
States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles Edwin, Claymont, DE, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,
United States (U.S. corporation)
Genencor International Inc., Palo Alto, CA, United
States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6025184		20000215
APPLICATION INFO.:	US 1997-966794		19971110 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Ketter, James
ASSISTANT EXAMINER: Yucel, Irem
NUMBER OF CLAIMS: 4
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 2 Drawing Figure(s); 2 Drawing Page(s)
LINE COUNT: 1105
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 4 OF 5 USPATFULL on STN
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active glycerol or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:104308 USPATFULL
TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism
INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles Edwin, Claymont, DE, United States
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5686276		19971111
APPLICATION INFO.:	US 1995-440293		19950512 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Lilling, Herbert J.		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1171		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 5 OF 5 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism.
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active glycerol or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

ACCESSION NUMBER: 2000:361176 BIOSIS
DOCUMENT NUMBER: PREV200000361176
TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism.
AUTHOR(S): Laffend, Lisa Anne [Inventor, Reprint author];
Nagarajan, Vasanth [Inventor]; Nakamura, Charles Edwin [Inventor]
CORPORATE SOURCE: Wilmington, DE, USA
ASSIGNEE: E. I. du Pont de Nemours and Company; Genencor International Inc.
PATENT INFORMATION: US 6025184 20000215
SOURCE: Official Gazette of the United States Patent and Trademark

Office Patents, (Feb. 15, 2000) Vol. 1231, No. 3. e-file.
CODEN: OGUPE7. ISSN: 0098-1133.
DOCUMENT TYPE: Patent
LANGUAGE: English
ENTRY DATE: Entered STN: 23 Aug 2000
Last Updated on STN: 8 Jan 2002

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(FILE 'HOME' ENTERED AT 18:03:15 ON 07 OCT 2005)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, FSTA, JICST-EPLUS,
BIOSIS, BIOTECHDS, SCISEARCH' ENTERED AT 18:03:44 ON 07 OCT 2005

L1 125 S "1,3-PROPANEDIOL PRODUCTION"
L2 106 S L1 AND (GLYCEROL OR DIHYDROXYACETONE)
L3 67 S L2 AND (CITROBACTER OR KLEBSIELLA)
E LAFFEND, L/AU
L4 3 S E1
L5 5 S E2
L6 0 S L4 AND L5

=> s l3 and (dhab1 or dhaT or dhaB3)

L7 23 L3 AND (DHAB1 OR DHAT OR DHAB3)

=> d l7 ti abs ibib tot

L7 ANSWER 1 OF 23 MEDLINE on STN

TI **1,3-Propanediol production** by
Escherichia coli expressing genes from the **Klebsiella pneumoniae**
dha regulon.

AB The dha regulon in **Klebsiella pneumoniae** enables the organism to
grow anaerobically on **glycerol** and produce 1,3-propanediol
(1,3-PD). Escherichia coli, which does not have a dha system, is unable
to grow anaerobically on **glycerol** without an exogenous electron
acceptor and does not produce 1,3-PD. A genomic library of K. pneumoniae
ATCC 25955 constructed in E. coli AG1 was enriched for the ability to grow
anaerobically on **glycerol** and **dihydroxyacetone** and was
screened for the production of 1,3-PD. The cosmid pTC1 (42.5 kb total
with an 18.2-kb major insert) was isolated from a 1,3-PD-producing strain
of E. coli and found to possess enzymatic activities associated with four
genes of the dha regulon: **glycerol** dehydratase (dhaB), 1,3-PD
oxidoreductase (dhaT), **glycerol** dehydrogenase (dhaD),
and **dihydroxyacetone** kinase (dhaK). All four activities were
inducible by the presence of **glycerol**. When E. coli AG1/pTC1
was grown on complex medium plus **glycerol**, the yield of 1,3-PD
from **glycerol** was 0.46 mol/mol. The major fermentation
by-products were formate, acetate, and D-lactate. 1,3-PD is an
intermediate in organic synthesis and polymer production. The 1,3-PD
fermentation provides a useful model system for studying the interaction
of a biochemical pathway in a foreign host and for developing strategies
for metabolic pathway engineering.

ACCESSION NUMBER: 92152855 MEDLINE

DOCUMENT NUMBER: PubMed ID: 1785929

TITLE: **1,3-Propanediol**
production by Escherichia coli expressing genes
from the **Klebsiella pneumoniae** dha regulon.

AUTHOR: Tong I T; Liao H H; Cameron D C

CORPORATE SOURCE: Department of Chemical Engineering, University of
Wisconsin, Madison 53706-1691.

SOURCE: Applied and environmental microbiology, (1991 Dec) 57 (12)
3541-6.

Journal code: 7605801. ISSN: 0099-2240.

PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199203
ENTRY DATE: Entered STN: 19920405
Last Updated on STN: 19980206
Entered Medline: 19920316

L7 ANSWER 2 OF 23 USPATFULL on STN

TI Promoter and plasmid system for genetic engineering
AB This invention provides a series of low-copy number plasmids comprising restriction endonuclease recognition sites useful for cloning at least three different genes or operons, each flanked by a terminator sequence, the plasmids containing variants of glucose isomerase promoters for varying levels of protein expression. The materials and methods are useful for genetic engineering in microorganisms, especially where multiple genetic insertions are sought.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2005:171221 USPATFULL
TITLE: Promoter and plasmid system for genetic engineering
INVENTOR(S): Payne, Mark S., Wilmington, DE, UNITED STATES
Picataggio, Stephen K., Landenberg, PA, UNITED STATES
Hsu, Amy K., Redwood, CA, UNITED STATES
Nair, Ramesh, Cupertino, CA, UNITED STATES
Valle, Fernando, Burlingame, CA, UNITED STATES
Soucaille, Philippe, San Francisco, CA, UNITED STATES
Trimbur, Donald Eugene, Redwood City, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005147968	A1	20050707
APPLICATION INFO.:	US 2003-420587	A1	20030422 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-374931P	20020422 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805, US	

NUMBER OF CLAIMS: 13
EXEMPLARY CLAIM: 1
LINE COUNT: 3811

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 3 OF 23 USPATFULL on STN

TI Glucose transport mutants for production of biomaterial
AB A method is disclosed for restoring a Glu.sup.+ phenotype to a PTS.sup.-/Glu.sup.- bacterial cell which was originally capable of utilizing a phosphotransferase transport system (PTS) for carbohydrate transport. Bacterial cells comprising the Glu.sup.+ phenotype have modified endogenous chromosomal regulatory regions which are operably linked to polynucleotides encoding galactose permeases and glucokinases.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2005:92941 USPATFULL
TITLE: Glucose transport mutants for production of biomaterial
INVENTOR(S): Cervin, Marguerite A., Redwood City, CA, UNITED STATES
Soucaille, Philippe, Deyme, FRANCE
Valle, Fernando, Burlingame, CA, UNITED STATES

Whited, Gregory M., Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005079617	A1	20050414
APPLICATION INFO.:	US 2003-728337	A1	20031203 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	WO 2003-US31544	20031003
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	LYNN MARCUS-WYNER, GENENCOR INTERNATIONAL, INC., 925 PAGE MILL ROAD, PALO ALTO, CA, 94304-1013, US	
NUMBER OF CLAIMS:	48	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	19 Drawing Page(s)	
LINE COUNT:	2804	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L7 ANSWER 4 OF 23 USPATFULL on STN
TI Production of 3-hydroxypropionic acid in recombinant organisms
AB The production of 3-hydroxypropionic acid (3-HP) from **glycerol** in a bacterial host is described. 3-HP is a useful feedstock for the production of polymeric materials. The genetic engineering of a bacterial host with two enzymes is sufficient to enable production of 3-HP. One enzyme is a **glycerol** dehydratase and the other is an aldehyde dehydrogenase.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
ACCESSION NUMBER: 2005:33157 USPATFULL
TITLE: Production of 3-hydroxypropionic acid in recombinant organisms
INVENTOR(S): Suthers, Patrick F., Madison, WI, United States
Cameron, Douglas C., N. Plymouth, MN, United States
PATENT ASSIGNEE(S): Wisconsin Alumni Research Foundation, Madison, WI, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6852517	B1	20050208
	WO 2001016346		20010308
APPLICATION INFO.:	US 2002-830751		20020910 (9)
	WO 2000-US23878		20000830
			20020910 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-151440P	19990830 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Saidha, Tekchand	
LEGAL REPRESENTATIVE:	Quarles & Brady LLP	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	1661	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L7 ANSWER 5 OF 23 USPATFULL on STN
TI Promoter and plasmid system for genetic engineering
AB This invention provides a series of low-copy number plasmids comprising restriction endonuclease recognition sites useful for cloning at least

three different genes or operons, each flanked by a terminator sequence, the plasmids containing variants of glucose isomerase promoters for varying levels of protein expression. The materials and methods are useful for genetic engineering in microorganisms, especially where multiple genetic insertions are sought.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:299232 USPATFULL
TITLE: Promoter and plasmid system for genetic engineering
INVENTOR(S): Payne, Mark S., Wilmington, DE, UNITED STATES
Picataggio, Stephen K., Landenberg, PA, UNITED STATES
Hsu, Amy Kuang-Hua, Redwood City, CA, UNITED STATES
Nair, Ramesh V., Cupertino, CA, UNITED STATES
Valle, Fernando, Burlingame, CA, UNITED STATES
Soucaille, Philippe, Deyme, FRANCE
Trimbur, Donald E., Landenberg, PA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004235099	A1	20041125
APPLICATION INFO.:	US 2003-739542	A1	20031218 (10)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 2003-420587, filed on 22 Apr 2003, ABANDONED		

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-374931P	20020422 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3842	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 6 OF 23 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high yield
AB The present invention provides a microorganism useful for biologically producing 1,3-propanediol from a fermentable carbon source at higher yield than was previously known. The complexity of the cofactor requirements necessitates the use of a whole cell catalyst for an industrial process that utilizes this reaction sequence to produce 1,3-propanediol. The invention provides a microorganism with disruptions in specified genes and alterations in the expression levels of specified genes that is useful in a higher yielding process to produce 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:196869 USPATFULL
TITLE: Process for the biological production of 1,3-propanediol with high yield
INVENTOR(S): Cervin, Marguerite A., Redwood City, CA, UNITED STATES
Soucaille, Philippe, Deyme, CA, UNITED STATES
Valle, Fernando, Burlingame, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004152174	A1	20040805
APPLICATION INFO.:	US 2003-680286	A1	20031006 (10)

NUMBER	DATE
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 PRIORITY INFORMATION: US 2002-416192P 20021004 (60)
 DOCUMENT TYPE: Utility
 FILE SEGMENT: APPLICATION
 LEGAL REPRESENTATIVE: E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT
 RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417
 LANCASTER PIKE, WILMINGTON, DE, 19805
 NUMBER OF CLAIMS: 8
 EXEMPLARY CLAIM: 1
 NUMBER OF DRAWINGS: 1 Drawing Page(s)
 LINE COUNT: 4322
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 7 OF 23 USPATFULL on STN
 TI Method for the recombination of genetic elements
 AB A method for the recombination of a gene is disclosed. The method involves the design of unpaired forward and reverse primers having homology to the 5' end of one template and to the 3' end of another template. Short primer extension periods results in a recombined template having paired 5' and 3' ends that can then be amplified. The amplified sample is devoid of any parental template.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:18783 USPATFULL
 TITLE: Method for the recombination of genetic elements
 INVENTOR(S): Milano, Joseph, Claymont, DE, UNITED STATES
 Tang, Xiao-Song, Hockessin, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004014085	A1	20040122
APPLICATION INFO.:	US 2003-374366	A1	20030226 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-360279P	20020226 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	57	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Page(s)	
LINE COUNT:	3857	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L7 ANSWER 8 OF 23 USPATFULL on STN
 TI Method for preparing 1,3-propanediol by a recombinant micro-organism in the absence of coenzyme B12 or one of its precursors
 AB The invention concerns a method for preparing 1,3-propanediol from a carbon-containing substance, said method comprising a step which consists in culturing a recombinant micro-organism not producing coenzyme B12 in the absence of coenzyme B12 or one of its precursors. The invention also concerns a nucleic acid coding for a **glycerol** dehydratase whereof the catalytic activity is independent of the presence of coenzyme B12 or one of its precursors and a nucleic acid coding for a 1,3-propanol dehydrogenase intervening in the synthesis of 1,3-propanediol. The invention further concerns recombinant vectors and host cells comprising said nucleic acids and the polypeptides coded by the latter.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:251130 USPATFULL
 TITLE: Method for preparing 1,3-propanediol by a recombinant micro-organism in the absence of coenzyme B12 or one of its precursors
 INVENTOR(S): Sarcabal, Patricia, Toulouse, FRANCE
 Croux, Christian, Castanet Tolosan, FRANCE
 Soucaille, Philippe, Deyme, FRANCE
 PATENT ASSIGNEE(S): Institut National de le Recherche Agronomique (INRA), Paris Cedex 07, FRANCE, 75341 (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003175916	A1	20030918
APPLICATION INFO.:	US 2002-43639	A1	20020109 (10)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	Mark B. Wilson, Fulbright & Jaworski L.L.P., Suite 2400, 600 Congress Avenue, Austin, TX, 78701		
NUMBER OF CLAIMS:	32		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	10 Drawing Page(s)		
LINE COUNT:	1759		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L7 ANSWER 9 OF 23 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer
 AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the **Klebsiella pneumoniae** dha regulon genes dhaR, orfY, **dhaT**, orfX, orfW, **dhaB1**, dhaB2, **dhaB3**, and orfZ, all these genes arranged in the same genetic organization as found in wild type **Klebsiella pneumoniae**. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (**dhaT**). The dramatically improved process relies on the presence in E. coli of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:225862 USPATFULL
 TITLE: Process for the biological production of 1,3-propanediol with high titer
 INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES
 Haynie, Sharon L., Philadelphia, PA, UNITED STATES
 Laffend, Lisa A., Claymont, DE, UNITED STATES
 Pucci, Jeff P., Pacifica, CA, UNITED STATES
 Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

NUMBER	DATE
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PRIORITY INFORMATION: US 1999-149534P 19990818 (60)
DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT
RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417
LANCASTER PIKE, WILMINGTON, DE, 19805

NUMBER OF CLAIMS: 29
EXEMPLARY CLAIM: 1
LINE COUNT: 3915
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 10 OF 23 USPATFULL on STN
TI 1,3-propanediol and polymer derivatives from a fermentable carbon source
AB A new polypropylene terephthalate composition is provided. The
polypropylene terephthalate is comprised of 1,3-propanediol and
terephthalate. The 1,3-propanediol is produced by the bioconversion of a
fermentatble carbon source, preferable glucose. The resulting
polypropylene terephthalate is distinguished from petrochemically
produced polymer on the basis of dual carbon-isotopic fingerprinting
which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:120275 USPATFULL
TITLE: 1,3-propanediol and polymer derivatives from a
fermentable carbon source
INVENTOR(S): Burch, Robert R., Exton, PA, UNITED STATES
Dorsch, Robert R., Hockessin, DE, UNITED STATES
Laffend, Lisa Anne, Claymont, DE, UNITED STATES
Nagarajan, Vasantha, Wilmington, DE, UNITED STATES
Nakamura, Charles, Claymont, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003082756	A1	20030501
APPLICATION INFO.:	US 2002-213203	A1	20020805 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1999-369796, filed on 6 Aug 1999, GRANTED, Pat. No. US 6428767 Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, GRANTED, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, GRANTED, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Page(s)		
LINE COUNT:	1785		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 11 OF 23 USPATFULL on STN
TI Mutant 1,3-propanediol dehydrogenase
AB The present invention relates to mutant 1,3-propanediol dehydrogenase
and a novel microorganism that is capable of growing in concentrations
of at least 105 g/l 1,3-propanediol, levels normally toxic to wild-type
microorganisms. The present invention also provides expression vectors
and host cells comprising the mutant 1,3-propanediol dehydrogenase as
well as methods for producing 1,3-propanediol comprising the use of
cells comprising the mutant 1,3-propanediol dehydrogenase.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:57527 USPATFULL
TITLE: Mutant 1,3-propanediol dehydrogenase
INVENTOR(S): Donald, Trimbur E., Redwood City, CA, UNITED STATES
Gregory, Whited M., Belmont, CA, UNITED STATES
Selifonova, Olga V., Navarre, MN, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003040091	A1	20030227
	US 6558933	B2	20030506
APPLICATION INFO.:	US 2001-991138	A1	20011116 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-570778, filed on 14 May 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-134868P	19990519 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	Genencor International, Inc., 925 Page Mill Road, Palo Alto, CA, 94034-1013	
NUMBER OF CLAIMS:	19	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Page(s)	
LINE COUNT:	914	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 12 OF 23 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the **Klebsiella pneumoniae** dha regulon genes dhaR, orfY, **dhaT**, orfX, orfW, **dhaB1**, dhaB2, **dhaB3**, and orfZ, all these genes arranged in the same genetic organization as found in wild type **Klebsiella pneumoniae**. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (**dhaT**). The dramatically improved process relies on the presence in E. coli of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:33323 USPATFULL
TITLE: Process for the biological production of 1,3-propanediol with high titer
INVENTOR(S): Emptage, Mark, Wilmington, DE, United States
Haynie, Sharon L., Philadelphia, PA, United States
Laffend, Lisa A., Claymont, DE, United States
Pucci, Jeff P., Pacifica, CA, United States
Whited, Gregory, Belmont, CA, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

NUMBER	KIND	DATE
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PATENT INFORMATION: US 6514733 B1 20030204
APPLICATION INFO.: US 2000-641652 20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Walicka, Malgorzata A	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)	
LINE COUNT:	3730	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 13 OF 23 USPATFULL on STN
TI METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources is an organism comprising DNA encoding protein X of a dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3. The protein X may be isolated from a diol dehydratase or a **glycerol** dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:30376 USPATFULL
TITLE: METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL
INVENTOR(S): DUNN-COLEMAN, NIGEL, LOS GATOS, CA, UNITED STATES
DIAZ-TORRES, MARIA, SAN MATEO, CA, UNITED STATES
CHASE, MATTHEW W., CHESTERFIELD, MO, UNITED STATES
TRIMBUR, DONALD, REDWOOD CITY, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003022323	A1	20030130
APPLICATION INFO.:	US 1999-308207	A1	19990513 (9)
	WO 1997-US20873		19971113
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	DEBRA J GLAISTER, GENENCOR INTERNATIONAL INC, 925 PAGE MILL ROAD, PALO ALTO, CA, 94304		
NUMBER OF CLAIMS:	40		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	27 Drawing Page(s)		
LINE COUNT:	4264		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 14 OF 23 USPATFULL on STN
TI Mutant 1,3-propandiol dehydrogenase
AB The present invention relates to mutant 1,3-propanediol dehydrogenase and a novel microorganism that is capable of growing in concentrations of at least 105 g/l 1,3-propanediol, levels normally toxic to wild-type microorganisms. The present invention also provides expression vectors and host cells comprising the mutant 1,3-propanediol dehydrogenase as well as methods for producing 1,3-propanediol comprising the use of cells comprising the mutant 1,3-propanediol dehydrogenase.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:275923 USPATFULL
TITLE: Mutant 1,3-propandiol dehydrogenase

INVENTOR(S): Donald, Trimbur E., Redwood City, CA, United States
Gregory, Whited M., Belmont, CA, United States
Selifonova, Olga V., Navarre, MN, United States
PATENT ASSIGNEE(S): Genencor International, Inc., Rochester, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6468773	B1	20021022
APPLICATION INFO.:	US 2000-570778		20000514 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-134868P	19990519 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Achutamurthy, Ponnathapu	
ASSISTANT EXAMINER:	Pak, Y	
LEGAL REPRESENTATIVE:	Ito, Richard T.	
NUMBER OF CLAIMS:	14	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 7 Drawing Page(s)	
LINE COUNT:	922	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 15 OF 23 USPATFULL on STN
TI Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport
AB Recombinant organisms are provided comprising genes encoding genes encoding **glycerol** dehydratase, 1,3-propanediol oxidoreductase, a gene encoding vitamin B.sub.12 receptor precursor(BtuB), a gene encoding vitamin B.sub.12 transport system permease protein(BtuC) and a gene encoding vitamin B.sub.12 transport ATP-binding protein (BtuD). The recombinant microorganism is contacted with a carbon substrate and 1,3-propanediol is isolated from the growth media.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
ACCESSION NUMBER: 2002:201883 USPATFULL
TITLE: Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport
INVENTOR(S): Bulthuis, Ben A., Hoofddorp, NETHERLANDS
Whited, Gregory M., Belmont, CA, United States
Trimbur, Donald E., Redwood City, CA, United States
Gatenby, Anthony A., Wilmington, DE, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)
Genencor International, Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6432686	B1	20020813
APPLICATION INFO.:	US 1999-307973		19990510 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-85190P	19980512 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Monshipouri, Maryam	
NUMBER OF CLAIMS:	13	

EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 0 Drawing Figure(s); 0 Drawing Page(s)
LINE COUNT: 2037
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 16 OF 23 USPATFULL on STN

TI Method for identifying the source of carbon in 1,3-propanediol
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentatble carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:194542 USPATFULL
TITLE: Method for identifying the source of carbon in 1,3-propanediol
INVENTOR(S): Burch, Robert R., Exton, PA, United States
Dorsch, Robert R., Hockessin, DE, United States
Laffend, Lisa Anne, Claymont, DE, United States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles, Claymont, DE, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)
Genencor International, Inc., Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6428767	B1	20020806
APPLICATION INFO.:	US 1999-369796		19990806 (9)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, now patented, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Wang, Andrew		
ASSISTANT EXAMINER:	Zara, Jane		
NUMBER OF CLAIMS:	1		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)		
LINE COUNT:	1761		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 17 OF 23 USPATFULL on STN

TI Method for the recombinant production of 1,3-propanediol
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources in an organism capable of **1,3-propanediol production** and comprising DNA encoding protein X of a microorganismal dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3, which proteins are comparable to those encoded by orfY, orfX and orfW, respectively from a microorganismal dha regulon. The protein X may be isolated from a diol dehydratase or a **glycerol** dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:142143 USPATFULL
TITLE: Method for the recombinant production of

INVENTOR(S) : 1,3-propanediol
Diaz-Torres, Maria, San Mateo, CA, United States
Dunn-Coleman, Nigel S, Los Gatos, CA, United States
Chase, Matthew W., Belmont, CA, United States
PATENT ASSIGNEE(S) : Trimbur, Donald, Redwood City, CA, United States
Genencor International, Inc., Rochester, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6136576		20001024
APPLICATION INFO.:	US 1997-969683		19971113 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Nashed, Nashaat T.	
NUMBER OF CLAIMS:	17	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	27 Drawing Figure(s); 27 Drawing Page(s)	
LINE COUNT:	4621	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 18 OF 23 USPATFULL on STN

TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active **glycerol** or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:18270 USPATFULL

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

INVENTOR(S) : Laffend, Lisa Anne, Wilmington, DE, United States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles Edwin, Claymont, DE, United States

PATENT ASSIGNEE(S) : E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)
Genencor International Inc., Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6025184		20000215
APPLICATION INFO.:	US 1997-966794		19971110 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Ketter, James		
ASSISTANT EXAMINER:	Yucel, Irem		
NUMBER OF CLAIMS:	4		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1105		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 19 OF 23 USPATFULL on STN

TI Method for the production of 1,3-propanediol by recombinant microorganisms
AB Recombinant organisms are provided comprising genes encoding **glycerol**-3-phosphate dehydrogenase, **glycerol**-3-phosphatase, **glycerol** dehydratase and 1,3-propanediol oxidoreductase activities useful for the production of 1,3-propanediol from a variety of carbon substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:4657 USPATFULL
TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms
INVENTOR(S): Nakamura, Charles E., Claymont, DE, United States
Gatenby, Anthony A., Wilmington, DE, United States
Hsu, Amy Kuang-Hua, Redwood City, CA, United States
La Reau, Richard D., Mountain View, CA, United States
Haynie, Sharon L., Philadelphia, PA, United States
Diaz-Torres, Maria, San Mateo, CA, United States
Trimbur, Donald E., Redwood City, CA, United States
Whited, Gregory M., Belmont, CA, United States
Nagarajan, Vasantha, Wilmington, DE, United States
Payne, Mark S., Wilmington, DE, United States
Picataggio, Stephen K., Landenberg, PA, United States
Nair, Ramesh V., Wilmington, DE, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)
Genencor International, Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6013494		20000111
APPLICATION INFO.:	US 1997-968563		19971112 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Railey, II, Johnny F.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3642	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 20 OF 23 USPATFULL on STN

TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active **glycerol** or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:104308 USPATFULL
TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism
INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States
Nagarajan, Vasantha, Wilmington, DE, United States
Nakamura, Charles Edwin, Claymont, DE, United States
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5686276		19971111
APPLICATION INFO.:	US 1995-440293		19950512 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Lilling, Herbert J.		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1171		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 21 OF 23 EMBASE COPYRIGHT (c) 2005 Elsevier B.V. All rights reserved on STN

TI **1,3-Propanediol production** by
Escherichia coli expressing genes from the *Klebsiella pneumoniae* dha regulon.

AB The dha regulon in *Klebsiella pneumoniae* enables the organism to grow anaerobically on **glycerol** and produce 1,3-propanediol (1,3-PD). *Escherichia coli*, which does not have a dha system, is unable to grow anaerobically on **glycerol** without an exogenous electron acceptor and does not produce 1,3-PD. A genomic library of *K. pneumoniae* ATCC 25955 constructed in *E. coli* AG1 was enriched for the ability to grow anaerobically on **glycerol** and **dihydroxyacetone** and was screened for the production of 1,3-PD. The cosmid pTC1 (42.5 kb total with an 18.2-kb major insert) was isolated from a 1,3-PD- producing strain of *E. coli* and found to possess enzymatic activities associated with four genes of the dha regulon: **glycerol** dehydratase (dhaB), 1,3-PD oxidoreductase (dhaT), **glycerol** dehydrogenase (dhaD), and **dihydroxyacetone** kinase (dhaK). All four activities were inducible by the presence of **glycerol**. When *E. coli* AG1/pTC1 was grown on complex medium plus **glycerol**, the yield of 1,3-PD from **glycerol** was 0.46 mol/mol. The major fermentation by-products were formate, acetate, and D-lactate. 1,3-PD is an intermediate in organic synthesis and polymer production. The 1,3-PD fermentation provides a useful model system for studying the interaction of a biochemical pathway in a foreign host and for developing strategies for metabolic pathway engineering.

ACCESSION NUMBER: 92014935 EMBASE

DOCUMENT NUMBER: 1992014935

TITLE: **1,3-Propanediol production** by *Escherichia coli* expressing genes from the *Klebsiella pneumoniae* dha regulon.

AUTHOR: Tong I.-T.; Liao H.H.; Cameron D.C.

CORPORATE SOURCE: Chemical Engineering Dept., University of Wisconsin, 1415 Johnson Drive, Madison, WI 53706-1691, United States

SOURCE: Applied and Environmental Microbiology, (1991) Vol. 57, No. 12, pp. 3541-3546.

ISSN: 0099-2240 CODEN: AEMIDF

COUNTRY: United States

DOCUMENT TYPE: Journal; Article

FILE SEGMENT: 004 Microbiology

LANGUAGE: English

SUMMARY LANGUAGE: English

ENTRY DATE: Entered STN: 920320

Last Updated on STN: 920320

L7 ANSWER 22 OF 23 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN

TI **1 3 PROPANEDIOL PRODUCTION BY**
ESCHERICHIA-COLI EXPRESSING GENES FROM THE KLEBSIELLA-PNEUMONIAE

DHA REGULON.

AB The dha regulon in *Klebsiella pneumoniae* enables the organism to grow anaerobically on **glycerol** and produce 1,3-propanediol (1,3-PD). *Escherichia coli*, which does not have a dha system, is unable to grow anaerobically on **glycerol** without an exogenous electron acceptor and does not produce 1,3-PD. A genomic library of *K. pneumoniae* ATCC 25955 constructed in *E. coli* AG1 was enriched for the ability to grow anaerobically on **glycerol** and **dihydroxyacetone** and was screened for the production of 1,3-PD. The cosmid pTC1 (42.5 kb total with an 18.2-kb major insert) was isolated from a 1,3-PD-producing strain of *E. coli* and found to possess enzymatic activities associated with four genes of the dha regulon: **glycerol** dehydratase (dhaB), 1,3-PD oxidoreductase (dhaT), **glycerol** dehydrogenase (dhaD), and **dihydroxyacetone** kinase (dhaK). All four activities were inducible by the presence of **glycerol**. When *E. coli* AG1/pTC1 was grown on complex medium plus **glycerol**, the yield of 1,3-PD from **glycerol** was 0.46 mol/mol. The major fermentation by-products were formate, acetate, and D-lactate. 1,3-PD is an intermediate in organic synthesis and polymer production. The 1,3-PD fermentation provides a useful model system for studying the interaction of a biochemical pathway in a foreign host and for developing strategies for metabolic pathway engineering.

ACCESSION NUMBER: 1992:95272 BIOSIS

DOCUMENT NUMBER: PREV199293051822; BA93:51822

TITLE: 1 3 PROPANEDIOL

PRODUCTION BY ESCHERICHIA-COLI EXPRESSING GENES FROM THE *KLEBSIELLA*-PNEUMONIAE DHA REGULON.

AUTHOR(S): TONG I-T [Reprint author]; LIAO H H; CAMERON D C

CORPORATE SOURCE: DEP CHEM ENG, 1415 JOHNSON DR, UNIV WIS, MADISON, WIS 53706-1691, USA

SOURCE: Applied and Environmental Microbiology, (1991) Vol. 57, No. 12, pp. 3541-3546.

CODEN: AEMIDF. ISSN: 0099-2240.

DOCUMENT TYPE: Article

FILE SEGMENT: BA

LANGUAGE: ENGLISH

ENTRY DATE: Entered STN: 12 Feb 1992

Last Updated on STN: 14 Apr 1992

L7 ANSWER 23 OF 23 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN

TI 1,3-PROPANEDIOL PRODUCTION BY ESCHERICHIA-COLI EXPRESSING GENES FROM THE *KLEBSIELLA*-PNEUMONIAE-DHA REGULON

AB The dha regulon in *Klebsiella pneumoniae* enables the organism to grow anaerobically on **glycerol** and produce 1,3-propanediol (1,3-PD). *Escherichia coli*, which does not have a dha system, is unable to grow anaerobically on **glycerol** without an exogenous electron acceptor and does not produce 1,3-PD. A genomic library of *K. pneumoniae* ATCC 25955 constructed in *E. coli* AG1 was enriched for the ability to grow anaerobically on **glycerol** and **dihydroxyacetone** and was screened for the production of 1,3-PD. The cosmid pTC1 (42.5 kb total with an 18.2-kb major insert) was isolated from a 1,3-PD-producing strain of *E. coli* and found to possess enzymatic activities associated with four genes of the dha regulon: **glycerol** dehydratase (dhaB), 1,3-PD oxidoreductase (dhaT), **glycerol** dehydrogenase (dhaD), and **dihydroxyacetone** kinase (dhaK). All four activities were inducible by the presence of **glycerol**. When *E. coli* AG1/pTC1 was grown on complex medium plus **glycerol**, the yield of 1,3-PD from **glycerol** was 0.46 mol/mol. The major fermentation by-products were formate, acetate, and D-lactate. 1,3-PD is an intermediate in organic synthesis and polymer production. The 1,3-PD fermentation provides a useful model system for

studying the interaction of a biochemical pathway in a foreign host and
for developing strategies for metabolic pathway engineering.

ACCESSION NUMBER: 1991:673060 SCISEARCH

THE GENUINE ARTICLE: GT942

TITLE: 1,3-PROPANEDIOL

PRODUCTION BY ESCHERICHIA-COLI EXPRESSING GENES
FROM THE **KLEBSIELLA**-PNEUMONIAE-DHA REGULON

AUTHOR: TONG I T (Reprint); LIAO H H; CAMERON D C

CORPORATE SOURCE: UNIV WISCONSIN, DEPT CHEM ENGN, 1415 JOHNSON DR, MADISON,
WI 53706; UNIV WISCONSIN, CTR BIOTECHNOL, MADISON, WI
53705

COUNTRY OF AUTHOR: USA

SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (DEC 1991) Vol.
57, No. 12, pp. 3541-3546.
ISSN: 0099-2240.

PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,
WASHINGTON, DC 20005-4171.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: LIFE; AGRI

LANGUAGE: English

REFERENCE COUNT: 33

ENTRY DATE: Entered STN: 1994

Last Updated on STN: 1994

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

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L9 and Saccharomyces	12

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<u>L10</u>	L9 and Saccharomyces	12	<u>L10</u>
<u>L9</u>	L8 and citrobacter	13	<u>L9</u>
<u>L8</u>	L7 and Klebsiella	13	<u>L8</u>
<u>L7</u>	L6 and dihydroxyacetone	13	<u>L7</u>
<u>L6</u>	L5 and glycerol	16	<u>L6</u>
<u>L5</u>	"1,3-propanediol production"	20	<u>L5</u>
<u>L4</u>	laffend.in.	4	<u>L4</u>
<u>L3</u>	L2 and l1	6	<u>L3</u>
<u>L2</u>	"dhaT"	22	<u>L2</u>
<u>L1</u>	"DhaB1"	6	<u>L1</u>

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☐ 1. Document ID: US 6803218 B1

L10: Entry 1 of 12

File: USPT

Oct 12, 2004

US-PAT-NO: 6803218

DOCUMENT-IDENTIFIER: US 6803218 B1

TITLE: Enzymes which dehydrate glycerol

DATE-ISSUED: October 12, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Seyfried; Markus	Silver Springs	MD		
Wiegel; Juergen	Athens	GA		
Whited; Gregory	Belmont	CA		

US-CL-CURRENT: 435/158

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 2. Document ID: US 6558933 B2

L10: Entry 2 of 12

File: USPT

May 6, 2003

US-PAT-NO: 6558933

DOCUMENT-IDENTIFIER: US 6558933 B2

TITLE: Mutant 1,3-propanediol dehydrogenase

DATE-ISSUED: May 6, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Donald; Trimbur E.	Redwood City	CA		
Gregory; Whited M.	Belmont	CA		
Selifonova; Olga V.	Navarre	MN		

US-CL-CURRENT: 435/190; 435/157, 435/158, 435/252.3, 435/320.1, 435/440, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 3. Document ID: US 6514733 B1

L10: Entry 3 of 12

File: USPT

Feb 4, 2003

US-PAT-NO: 6514733

DOCUMENT-IDENTIFIER: US 6514733 B1

TITLE: Process for the biological production of 1,3-propanediol with high titer

DATE-ISSUED: February 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Emptage; Mark	Wilmington	DE		
Haynie; Sharon L.	Philadelphia	PA		
Laffend; Lisa A.	Claymont	DE		
Pucci; Jeff P.	Pacifica	CA		
Whited; Gregory	Belmont	CA		

US-CL-CURRENT: 435/158; 435/155, 435/252.33

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 4. Document ID: US 6468773 B1

L10: Entry 4 of 12

File: USPT

Oct 22, 2002

US-PAT-NO: 6468773

DOCUMENT-IDENTIFIER: US 6468773 B1

TITLE: Mutant 1,3-propandiol dehydrogenase

DATE-ISSUED: October 22, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Donald; Trimbur E.	Redwood City	CA		
Gregory; Whited M.	Belmont	CA		
Selifonova; Olga V.	Navarre	MN		

US-CL-CURRENT: 435/190; 435/440, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 5. Document ID: US 6432686 B1

L10: Entry 5 of 12

File: USPT

Aug 13, 2002

US-PAT-NO: 6432686

DOCUMENT-IDENTIFIER: US 6432686 B1

TITLE: Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport

DATE-ISSUED: August 13, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bulthuis; Ben A.	Hoofddorp			NL
Whited; Gregory M.	Belmont	CA		
Trimbur; Donald E.	Redwood City	CA		
Gatenby; Anthony A.	Wilmington	DE		

US-CL-CURRENT: 435/158; 435/252.3, 435/320.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 6. Document ID: US 6428767 B1

L10: Entry 6 of 12

File: USPT

Aug 6, 2002

US-PAT-NO: 6428767

DOCUMENT-IDENTIFIER: US 6428767 B1

TITLE: Method for identifying the source of carbon in 1,3-propanediol

DATE-ISSUED: August 6, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Burch; Robert R.	Exton	PA		
Dorsch; Robert R.	Hockessin	DE		
Laffend; Lisa Anne	Claymont	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles	Claymont	DE		

US-CL-CURRENT: 424/1.37; 250/281, 250/282, 424/1.11, 435/6, 435/93

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 7. Document ID: US 6136576 A

L10: Entry 7 of 12

File: USPT

Oct 24, 2000

US-PAT-NO: 6136576

DOCUMENT-IDENTIFIER: US 6136576 A

TITLE: Method for the recombinant production of 1,3-propanediol

DATE-ISSUED: October 24, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Diaz-Torres; Maria	San Mateo	CA		
Dunn-Coleman; Nigel S	Los Gatos	CA		
Chase; Matthew W.	Belmont	CA		
Trimbur; Donald	Redwood City	CA		

US-CL-CURRENT: 435/158; 435/232, 530/350, 536/23.1, 536/23.2, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 8. Document ID: US 6025184 A

L10: Entry 8 of 12

File: USPT

Feb 15, 2000

US-PAT-NO: 6025184

DOCUMENT-IDENTIFIER: US 6025184 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Laffend; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/252.33; 435/252.3, 435/320.1

Full	Title	Citation	Front	Review	Classification	Date	Reference		Claims	KMC	Draw Desc	Ima
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☐ 9. Document ID: US 6013494 A

L10: Entry 9 of 12

File: USPT

Jan 11, 2000

US-PAT-NO: 6013494

DOCUMENT-IDENTIFIER: US 6013494 A

TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nakamura; Charles E.	Claymont	DE		
Gatenby; Anthony A.	Wilmington	DE		
Hsu; Amy Kuang-Hua	Redwood City	CA		
La Reau; Richard D.	Mountain View	CA		
Haynie; Sharon L.	Philadelphia	PA		
Diaz-Torres; Maria	San Mateo	CA		
Trimbur; Donald E.	Redwood City	CA		
Whited; Gregory M.	Belmont	CA		
Nagarajan; Vasantha	Wilmington	DE		
Payne; Mark S.	Wilmington	DE		
Picataggio; Stephen K.	Landenberg	PA		
Nair; Ramesh V.	Wilmington	DE		

US-CL-CURRENT: 435/158; 435/252.3, 435/252.33, 435/254.21, 435/69.1

Full	Title	Citation	Front	Review	Classification	Date	Reference		Claims	KMC	Draw Desc	Ima
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☐ 10. Document ID: US 5821092 A

L10: Entry 10 of 12

File: USPT

Oct 13, 1998

US-PAT-NO: 5821092

DOCUMENT-IDENTIFIER: US 5821092 A

TITLE: Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase

DATE-ISSUED: October 13, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/158; 435/232, 435/252.3, 435/252.31, 435/252.33, 435/252.35,
435/252.5, 435/252.7, 435/320.1, 536/23.1, 536/23.2, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	RIID	Draw Desc	Ima
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☐ 11. Document ID: US 5686276 A

L10: Entry 11 of 12

File: USPT

Nov 11, 1997

US-PAT-NO: 5686276
DOCUMENT-IDENTIFIER: US 5686276 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: November 11, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Laffend; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: [435/158](#); [435/252.31](#), [435/252.33](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMIC	Draw Desc	Ima
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☐ 12. Document ID: US 5599689 A

L10: Entry 12 of 12

File: USPT

Feb 4, 1997

US-PAT-NO: 5599689
DOCUMENT-IDENTIFIER: US 5599689 A

TITLE: Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures

DATE-ISSUED: February 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Haynie; Sharon L.	Philadelphia	PA		
Wagner; Lorraine W.	Newark	DE		

US-CL-CURRENT: [435/42](#); [435/158](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMIC	Draw Desc	Ima
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Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: US 6514733 B1

L4: Entry 1 of 4

File: USPT

Feb 4, 2003

US-PAT-NO: 6514733

DOCUMENT-IDENTIFIER: US 6514733 B1

TITLE: Process for the biological production of 1,3-propanediol with high titer

DATE-ISSUED: February 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Emptage; Mark	Wilmington	DE		
Haynie; Sharon L.	Philadelphia	PA		
<u>Laffend</u> ; Lisa A.	Claymont	DE		
Pucci; Jeff P.	Pacifica	CA		
Whited; Gregory	Belmont	CA		

US-CL-CURRENT: 435/158; 435/155, 435/252.33

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 2. Document ID: US 6428767 B1

L4: Entry 2 of 4

File: USPT

Aug 6, 2002

US-PAT-NO: 6428767

DOCUMENT-IDENTIFIER: US 6428767 B1

TITLE: Method for identifying the source of carbon in 1,3-propanediol

DATE-ISSUED: August 6, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Burch; Robert R.	Exton	PA		
Dorsch; Robert R.	Hockessin	DE		
<u>Laffend</u> ; Lisa Anne	Claymont	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles	Claymont	DE		

US-CL-CURRENT: 424/1.37; 250/281, 250/282, 424/1.11, 435/6, 435/93

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 3. Document ID: US 6025184 A

US-PAT-NO: 6025184
DOCUMENT-IDENTIFIER: US 6025184 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Laffend</u> ; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/252.33; 435/252.3, 435/320.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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☐ 4. Document ID: US 5686276 A

L4: Entry 4 of 4

File: USPT

Nov 11, 1997

US-PAT-NO: 5686276
DOCUMENT-IDENTIFIER: US 5686276 A

TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism

DATE-ISSUED: November 11, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
<u>Laffend</u> ; Lisa Anne	Wilmington	DE		
Nagarajan; Vasantha	Wilmington	DE		
Nakamura; Charles Edwin	Claymont	DE		

US-CL-CURRENT: 435/158; 435/252.31, 435/252.33

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Ima
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<u>L10</u>	L9 and Saccharomyces	12	<u>L10</u>
<u>L9</u>	L8 and citrobacter	13	<u>L9</u>
<u>L8</u>	L7 and Klebsiella	13	<u>L8</u>
<u>L7</u>	L6 and dihydroxyacetone	13	<u>L7</u>
<u>L6</u>	L5 and glycerol	16	<u>L6</u>
<u>L5</u>	"1,3-propanediol production"	20	<u>L5</u>
<u>L4</u>	laffend.in.	4	<u>L4</u>
<u>L3</u>	L2 and l1	6	<u>L3</u>
<u>L2</u>	"dhaT"	22	<u>L2</u>
<u>L1</u>	"DhaB1"	6	<u>L1</u>

END OF SEARCH HISTORY